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On the Current Price, and the Cost Price, of Corn, in England, during the last Ten Years, as illustrating the value of Agricultural Statistics.
By J. T. DANSON, Esq.

[Read before the Statistical Section of the British Association for the Advancement of Science, at Liverpool, 25th September, 1854.]

The purpose of this Paper

Is to bring to view some of the effects upon the corn-growers of England, considered as capitalists, of the annual fluctuations in the average price of corn.

These fluctuations have in all countries, and at all times, been deemed inconvenient to the *consumers* of corn; in other words to the entire population. When great, they draw after them the greatest calamities that afflict the human race. And all the efforts that have yet been made to prevent them have evidently left much to be done. When governments have tried restrictions on the trade in corn, they have invariably made matters worse. And free trade, though it removes all restrictions on the distribution of the world's stock for each season, still leaves us—as the experience of the last few years has proved—subject to causes of fluctuation too powerful to be agreeable, or to be long disregarded.

What these remaining causes are I shall not here attempt to point out; though the directions in which they may most hopefully be sought for, will be readily inferred from an examination of the tables appended to this paper. Nor do I propose, here, to regard the effect of these fluctuations upon the consumer; but, first to state their amount, and some of the more prominent of the circumstances attending them, during the last ten years; and then to draw your attention to a somewhat narrower field of view—I mean their bearing upon *the producer*; and thence to the bearing of the facts upon one of the leading questions of the day.

As it is obviously the chief purpose of any such system of agricultural statistics as that now under discussion, to enable us to reduce these fluctuations within narrower limits, I trust the results

of the present paper may be found useful in more clearly showing the practical value of such statistics—possibly even in aiding the formation of the system, and (though last, not least) in marking the value, to *the farmer* himself, of information which, as it will be demanded on behalf of the consumers, he may not reasonably suppose is calculated especially to promote their interest.

The Materials used.

The materials available, and of any value, are but scanty. First, there is the weekly average price of each of the six descriptions of grain and pulse—wheat, barley, oats, rye, beans, and pease—published in the London Gazette. This average is based, as is generally known, upon returns, obtained every week, from each of 290 towns in England and Wales, in which corn markets are held. This under the authority of the Act 5 Vict. c. 14, s. 9, (passed 29th April 1842) and better known as the Corn Act of that year. These returns give, for each town, the quantity of each description of corn sold, and the average price, as deduced by the local officer from statements received by him from the dealers, under penalties for withholding or misstating the facts. From the local quantities and prices, a general total and average are made up, and published every week. And at the end of the year a like total and average is made up for the year.

The weekly averages are, I believe, made up in such a manner as to be trustworthy. But the annual average is, for any such purpose as the present, somewhat defective. In the first place, it is the practice of the office in London (or was so until recently) to deduce the annual average price from the weekly averages, simply by adding them together, and dividing by the number of weeks in the year: a method obviously erroneous, inasmuch as, the quantity sold at each of these weekly averages not being the same, the influence of each upon the common average should not be the same. The practical effect of this error is not usually of much importance, except in years such as 1847—when the home stock of corn being run very low before the new stock comes in, the quantities sold during the last few months before the harvest are unusually small. Speaking generally, its effect is to give an undue influence to the *later* averages of the harvest year—the quantities brought to market decreasing, upon an average of years, with some regularity, from the date of one harvest to that of the next.

Another objection to which these annual averages are open is this:—there is no definite relation between the year to which they apply (that being the year of the Almanac, running from the beginning of January to the end of December) and the year within which each crop of corn is produced and consumed. In short, the almanac year is not the agricultural or harvest year. Nor, indeed, does the harvest year admit of precise dates. Its beginning and ending must, in fact, vary with the seasons; and were it my present purpose to mark with the utmost precision the difference between the annual average prices of the Gazette, and those applicable to the produce of each of the last ten harvests, it would be necessary to vary the actual duration of several of the harvest years by two or three weeks. But if we take the *average* date of the gathering of the corn harvest in

England as a starting point, it will be found that the period during which the produce of each successive crop of corn maintains possession of the market, includes about sixteen or seventeen weeks of one almanac year, and about thirty-five or thirty-six weeks of the next. For all practical purposes, perhaps we may safely assume that the first week of September is, one year with another, the first in which the new corn annually comes into use.

As to the *foreign supply*, we have the returns made to the Board of Trade by the Customs authorities, and published monthly, of the quantities of corn (with other articles) imported into the United Kingdom, and the quantity entered as retained for home consumption. For our present purpose—the paper being confined to the corn trade of England and Wales, and these returns of imports having reference to the United Kingdom—it may be objected that the materials cannot properly be used without distinguishing the proportions of the imported supply carried into the consumption of Ireland and Scotland. But there are no means of making any such distinction in a trustworthy manner; and, practically, it is not necessary; inasmuch as the imports of corn from abroad into the United Kingdom (alike wheat, barley, and oats, but more particularly wheat) though some portions of them enter the ports of Scotland and Ireland, do, in effect, as both those countries, in the regular course of things, send corn to England, operate to increase the *English supply*.

Average Prices, 1843-1853.

In Table I. (see Appendix) will be found stated the annual average prices, as published in the Gazette, for the eleven (almanac) years 1843-53, of *wheat, barley, and oats*. I repeat them here in decimals of a pound sterling:—

Annual Average Prices, per Gazette.

Years.	Wheat.	Barley.	Oats.
1843.....	2·504	1·475	.916
1844.....	2·562	1·683	1·029
1845.....	2·541	1·583	1·125
1846.....	2·733	1·633	1·183
1847.....	3·487	2·218	1·433
1848.....	2·525	1·575	1·025
1849.....	2·212	1·387	.875
1850.....	2·012	1·171	.821
1851.....	1·925	1·237	.929
1852.....	2·037	1·425	.954
1853.....	2·662	1·658	1·05

In Table II. (see Appendix) will be found, similarly stated, the annual average prices of *wheat, barley, and oats*, as computed for the harvest years, from the first week of September forward; but by use of the same method as is used for obtaining the official annual prices. These, also, I repeat here in a decimal form:

Annual Average Prices for Harvest Years.

Harvest Years.	Wheat.	Barley.	Oats.
1843—44.....	£2·65	1·625	.983
1844—45.....	2·354	1·621	1·075
1845—46.....	2·729	1·508	1·154
1846—47.....	3·546	2·329	1·471
1847—48.....	2·558	1·571	1·066
1848—49.....	2·383	1·475	.929
1849—50.....	2·017	1·229	.816
1850—51.....	1·991	1·204	.908
1851—52.....	1·991	1·379	.883
1852—53.....	2·229	1·496	.95
1853—54.....	3·7	1·9	1·346

If these two sets of prices be compared, by taking from the first the prices of the ten almanac years, 1844—53, and from the second the ten harvest years, 1843—44 to 1852—53, it will be observed that the former (the series of *almanac* years,) will give the highest decimal average. This is accounted for by the range of prices in the four last months of 1843 having been lower than in the corresponding part of 1853, the former being taken in, and the latter omitted, in forming the observed series of *harvest* years. The ten almanac years give a common average for

	Wheat.	Barley.	Oats.
Of	£2·469	£1·557	£1·042
Or	49s. 5d.	31s. 2d.	20s. 10d.

While the ten harvest years give an average for

	Wheat.	Barley.	Oats.
Of	£2·444	£1·543	£1·023
Or	48s. 10d.	30s. 10d.	20s. 5d.

Inspected Supply of British Wheat.

The tables above, as I have said, are both vitiated, though to no great extent, by a defective mode of computation: one which does not regard the fluctuations occurring in the quantities of corn brought to market at different periods throughout the year. Before proceeding further, therefore, it is necessary to have regard to these quantities.

And as the exhibition of these quantities involves the use of a large additional number of figures, I shall here narrow the field of view, and confine it to *wheat* only, this being, in every point of view, the most important description of corn: all others usually following it (nearly) in their fluctuations of price; and the inferences fairly deducible from the figures, as thus limited, being amply sufficient for the present purpose, as well as quite sufficient to tax your attention with at one time.

In Table III., then, (see Appendix) will be found stated the *quantities* of British wheat returned as sold in the 290 inspected markets of England and Wales, in each month of the eleven harvest years ending with the last week of August in the present year (1854).

It will be observed that the largest quantities are sold in the

months of October, November, December, and January ; the averages taken over the eleven years, being, for each month, as follow :—

Qrs.	Qrs.
September..... 432,839	March 419,442
October..... 530,739	April 343,751
November..... 459,049	May 406,941
December..... 474,360	June 366,407
January..... 455,847	July 339,771
February..... 385,976	August 390,052

The average monthly quantity sold in the four months of October, November, December, and January, is about 480,000 quarters. In the other eight months of the year the average very little exceeds 385,000 quarters. And this is just what we might expect. The corn is threshed out and brought to market under the motives, generally more or less mixed, of (1) convenience for threshing, (2) hope for extra profit, and (3) want of money. Convenience for threshing is most commonly found by the farmer in those months when work out of doors is most difficult and least needed. Hope for extra profit prompts extra supplies chiefly in the first months of a harvest year in which the experience or the apprehension of scarcity has caused high prices. And want of money often compels the poor farmer to force his corn into the market within a month or two after it is gathered from the fields. But, whatever the causes of these fluctuations, it is obvious that, without due regard to them, we cannot deduce from the weekly average prices an annual price which shall truly represent that paid by the consumer, and received by the producer, from year to year.

Average Prices in Harvest Years.

In Table IV. (see Appendix) will be found the monthly prices of wheat, as published by the Board of Trade, arranged in harvest years, from September, 1843, to September, 1854. And here it will at once be seen that, as the first months of the harvest year give the largest supplies, so they also give the lowest prices per quarter ; the averages for each month, taken over eleven years, being as under :—

	£		£
September.....	2·404	March	2·583
October.....	2·462	April	2·575
November.....	2·504	May	2·641
December.....	2·475	June	2·658
January.....	2·558	July	2·641
February.....	2·575	August	2·575

Or stated quarterly :—

	£	s. d.
1st quarter.....	2·456	or 49 1
2nd "	2·536	" 50 9
3rd "	2·599	" 52 0
4th "	2·658	" 53 2

Supply in Harvest Years.

In Table V. (see Appendix) are collected, under one view, the quantities of wheat returned as sold in each quarter of the eleven harvest years, from September 1843, to September 1854, with the quantity in each quarter above or below the average of the same

quarter during the whole period; and also the average *prices* (obtained by the official method*) for each quarter, with the like variation of such price above or below the average of the whole period.

Here the excess of price is seen to coincide, generally, with the deficiency of supply of British wheat, so far as this supply may be inferred from the sales in the inspected markets; but it is apparent that the agreement of the two elements is far from complete. This may remind us that the foreign supply is still not in view; and that this operates upon the average price equally with the home supply.

Total Supply of British Wheat.

In Table VI. I have endeavoured to complete, hypothetically, our view of the home supply, by assuming that the quantity sold in the inspected markets forms $\frac{5}{14}$ ths of the total quantity consumed, or rather the total quantity kept or sold by the producer for consumption, and therefore excluding so much of the actual current supply as may be reserved for seed. With the aid of this assumption I am enabled to approximate what may be deemed the true average price, as received by the grower, in each harvest year; and thence to show how much money may be reasonably supposed to have passed from the consumers to the producers in each such year, in exchange for the crop of that year. An enumeration of these sums, by harvest years, will afford the first distinct view of the nature of the fluctuations to which, by this paper, I desire to draw your attention:—

Total Sums apparently received by the British Producers of Wheat, in each of the last Eleven Harvest Years.

\mathcal{L}	\mathcal{L}
1843—44..... 38,953,000	1849—50..... 27,817,000
1844—45..... 43,910,000	1850—51..... 24,063,000
1845—46..... 41,672,000	1851—52..... 26,936,000
1846—47..... 50,989,000	1852—53..... 30,195,000
1847—48..... 37,647,000	1853—54..... 34,864,000
1848—49..... 30,009,000	

The annual average amount is about 35,240,000*l.* The highest average price occurred in the last year (that just expired); but the deficiency of the supply seems to have reduced the receipts of the grower, notwithstanding this high price, somewhat below the average amount. Hence, and in order partly to simplify the subsequent calculations, and partly to avoid reliance upon statistical data of so very recent acquirement, and which cannot be completed, in some respects, without the aid of hypothesis, I exclude that year (1853-4) from view. Leaving it out, and confining our attention to the ten harvest years from September, 1843, to September, 1853, it will be observed:—

1. That the farmer's receipts were *above* the average in every year of the *first five*, and below it in every year of the *last five*.
2. That in the first five years he appears to have received for his wheat a total of about 213,000,000*l.* sterling, or about 37,000,000*l.* more than he would have received, had the average price of those five years been the same as the average price of the whole ten; and

* When the use of this method is limited to the quarters, the effect of its erroneous form is scarcely appreciable in the result.

3. That in the second five years he received only about 139,000,000*l.* sterling, or about 37,000,000*l.* less than he would have received had the decennial average price prevailed throughout the ten years.

In one year of the ten (1846-7,) the apparent supply of British wheat barely exceeded 15,000,000 of quarters; and it brought nearly 51,000,000*l.* sterling. In another year (1850-51) the same supply appears to have barely exceeded 12,000,000 quarters, and to have brought only 24,000,000*l.* sterling.

Again, in the *first five* of these harvest years, the average price of wheat appears to have been, allowing for the erroneous official mode of calculation, about 53*s.* 11*d.* per quarter. In the last five years it was only 42*s.* 6*d.*, a difference of more than 10*s.* per quarter. And on reference to Table II. it appears that the prices of barley and oats fluctuated much in the same way: the average prices of barley, for the first five years, having been 34*s.* 7*d.*, and for the last five years only 27*s.* 1*d.*; and of oats, for the first five years 23*s.*, and for the second only 17*s.* 11*d.*

And here we are reminded that the fluctuations taking place in the price of wheat, the material of bread, indicate very nearly similar movements in the prices of all the more commonly-used descriptions of food raised by the English farmer; and consequently that he cannot, as a rule, be supposed to have derived any material advantage from countervailing fluctuations in the prices of other descriptions of agricultural produce.

The Foreign Supply.

In Table VII. I have brought together the estimated quantity of home-grown wheat supplied in each harvest year, and the *foreign* supply of wheat and flour entered for consumption in this country in the same year. With the whole of the supply for each year thus apparently before us, we find, however, that the fluctuations of supply and of price were not, in several instances, nearly coincident. The price did not uniformly rise in proportion, or nearly in proportion, to the falling off of the supply, or *vice versa*. Here, however, we may refer to several disturbing influences (apart from variations of the supply) well known to have been in operation during this period. The *demand* was much affected by the failure of the potato crop, especially in 1846-7. It was also affected by fluctuations in the current purchasing power of a large proportion of the consumers. Nor was the irregularity introduced into the *growth of our population*, by the progress of emigration, and by one or two lesser causes, without influence in the same direction. But it were beside the present purpose to pursue the line of investigation here suggested.

The Effect of these Fluctuations on Agriculture, as an Investment for Capital.

It may be observed, and it must be admitted, that every advance in the art of farming tends to diminish in some degree the influence of the seasons; and that the best farmers may be reasonably supposed to have been least exposed to the effect of these fluctuations, in consequence of their having held, in bad seasons, more than an

equal proportion of the saleable produce of the season. But these considerations have no influence on the general conclusion. They only conduct us to the further inference that, while the fluctuations exhibited in these averages were nearly those felt by *the farmer of average skill, capital, and forethought*, and the best farmers suffered somewhat less, there must have been a large number who suffered more—a large number by whom the comparatively high prices of the first five of these harvest years (giving an average, as we have seen, of only 53s. 11d. per quarter) were received as by no means excessive, or indicative of the probability of a counteracting fall; while the low prices of the last five years can have operated on this (the poorest and most numerous) class of our corn-producers, as such a series of low prices (accompanied by crops rather under than over an average) only can act: *to the dispersion as income of a portion of their already deficient capital.*

It is at the point of view thus suggested that I would most especially request the attention of the section, believing, as I do, that we here obtain a distinct and accurate view of some of the most powerful of the influences now acting prejudicially on the business of agriculture in this country—in other words, on the business of raising, year by year, the food which forms the first necessary of life to us all. A few there are to whom these fluctuations mean only the occasional, and but temporary, surrender of little-needed luxuries; or scarcely even that. But to the great body of the nation they are, it is almost needless to say, of the highest temporal importance, inasmuch as the disturbance they produce in all the channels of trade, added to the actual suffering in time of scarcity from lack of food, and of that which is given up to secure food, is found at the root of a very large proportion of the misery and crime, the gradual eradication of which is at once the best proof and the highest reward of our success in science. But to return to the immediate purpose.

Every one acquainted with commercial transactions knows that, of all the arts of life, there is not one of which it may not be confidently asserted that its methods will be improved and its results cheapened in proportion as *capital* (under the guidance of due skill) shall be applied to its culture. In proportion as the return upon a given investment of capital, in any business whatever, may be counted upon with certainty, with respect to time and amount, so, invariably, does that business attract to itself capital, and with capital the continuous industry and ability required to perfect its methods, and to render its returns still more secure and equable. In other words, *the element of uncertainty, wherever found, deters the prudent man*; and while alluring the speculative, by imparting to the occupation something of the hazardous allurement of gambling, as surely tends to lower the available credit of those whose means are thus invested. And the first lesson learnt from the figures now before us is, that the returns upon capital invested in corn-growing in England are now extremely uncertain.

Cost Price of British Wheat.

What may have been the cost price of wheat to the producer during this period of ten years can, of course, only be guessed at.

If we accept the fact of the markets having been supplied during so long a period, as evidence that the producers were, on an average of the whole period, in receipt of profits sufficient to induce them to retain their capital in that form of investment, we may safely take the average price of the ten years as covering the cost. This average is about 48s. 3d. per quarter, a sum, I believe, quite as low as the best informed advocates of free trade in corn have hoped to see established as the average of a long period of years. Nor, low as it is, as compared with the prices talked of some years ago as necessary to maintain the growth of corn in this country, can I doubt that the English farmer would be a gainer at this price, *could it be approximated more nearly year by year.*

The Price the Farmer wants.

One of the fallacies which a few years ago were too well ventilated to survive was the assertion that the farmer's interest required a high price of corn. What he really wants for all his produce is precisely what his customers' want—*a price that does not fluctuate too much.* A low price, other things being the same, is good for the whole nation, farmers and all. It means only that the necessaries of life are easily obtained. What the farmer lives by is not the *price* he gets, but the *profit* he gets. As for his *rent*, it is part of his business to know the value of the land he tills; and, if he pays his landlord more than it is worth, he commits precisely the same error as a manufacturer who pays more than he should for his factory, his machinery, or his raw material. In buying all these things as cheaply as he can, he and the manufacturer alike pursue their own profit, to the good of the public, and succeed in the pursuit exactly as they excel in the occupation they have chosen. Both, in fact, in directly seeking profit, must, though indirectly, do all they can to lower prices. They can no more separate the two operations than they can move in two directions at the same time. But what both also desire, and most legitimately desire is, that in commencing each transaction involving a renewed investment of capital, they may see, with as much certainty as possible, what the returns will be. Absolute certainty is, of course, impossible, and is never expected; but the nearest possible approximation to it is perfectly well recognized as evidence of the highest attainable skill in commerce. May we not accept the absence of any such approximation, in the production of corn, as evidence of a culpable lack of commercial skill in that branch of the national business?

What is to be done?

Patent the evil; but latent the remedy. How shall we attain greater fixity of price? It were to tax your attention most unreasonably to enter at any length upon what is suggested by this question; and I shall certainly not presume to answer it. The purpose of the present paper has been defined; and when I shall have induced you to consider how *the farmer* is affected by these fluctuations of price, and how nearly identical is his interest with that of the consumer in promoting every means of reducing them within narrower limits, that purpose will have been effected.

I may, however, be permitted to suggest that the remedy here required is probably not very different from that which we may see generally succeeding in like cases: I mean *the application of greater intelligence to the operations in question*; in other words, a more general application to the art of farming of the methods and facilities which have been found to promote success in weaving calico, in building ships, and in every other form of production.

Agriculture now undoubtedly owns the distinction of being at once the most ancient, the most necessary, and the most rudely practised of all the arts of life. To the business of raising and storing the food of the nation is devoted (in proportion to its importance) less capital, less skill, and less forethought, than to any other branch of the national business. And the manner in which the food of the nation is annually made the sport of the elements seems to be nothing more than one of the natural results of this arrangement. Anomalous, this, and yet quite consistent with the actual condition, in a mercantile point of view, of the producers of our annual supply of home-grown corn. I do not speak of exceptions, but of a very large majority.

It is obvious to remark that, as a body, farmers enjoy few of the intellectual advantages open to those whose business is carried on in towns; and the result is seen in a somewhat low standard of general intelligence. They have, comparatively, few ideas, and many prejudices. Locally dispersed, they cannot mingle much with each other. Few of them communicate with any common centre of intelligence likely to expand their views of their own occupation, or to suggest any common or combined action. There are even few among them who make any continuous or systematic record of their pecuniary transactions. And, finally, there is no class of men to whom the resources of credit, so amply employed in most other branches of industry, are so little available on safe grounds. In any other business a man of proved ability and integrity finds no appreciable difficulty in any prudent extension of his operations by the aid of borrowed capital. But this is rarely done in farming; and where done seldom affords much encouragement to the capitalist. Several causes are here found acting together. The local and social peculiarities of the class (already referred to) exercise some influence. Something is also due to the slow nature of the business: the capital invested being generally turned only once a year; and something also to the inaptitude of farmers (as a class) to take up new business facilities of any kind. But were all these removed, or overcome, there remains behind the greatest of all—the uncertainty of the returns, not so much of the amount of the crop (for good farming already goes far, and every year goes farther, to remove this), but of the price to be obtained for it.

I have said that farmers, notwithstanding the uncertainty of the returns on their capital, and the consequent necessity of their occasionally drawing upon capital for their current means of subsistence, have comparatively few facilities for availing themselves of the use of credit. It follows that, as a class, they make less use of the facilities of banking than any other class investing a similar amount of capital. Speaking generally, *the farmer makes his stack-yard his*

bank, whenever he is in a condition to need one, and is much ruled in his choice of a time for bringing his corn to market by the pressure of the pecuniary demands upon him. Hence, whenever high prices have prevailed long enough to set him at his ease, he is apt to hold his corn on hand quite as much because he can afford to do it, and because to sell when money is not immediately wanted has, by the force of habit, come to be deemed by him a somewhat needless, if not thriftless, proceeding, as from any hope of ultimate gain by so doing. Of course, judged by the standard applied to all other commercial affairs, a sale of produce, timed solely to meet, and prompted by, the demands of creditors, can only be regarded as a very undesirable, and by no means unexceptionable mode of carrying on business. And on the other hand, it is fairly open to discussion whether, when a farmer holds his corn with a view to obtaining a higher price for it, he does not quit, in some sort, his legitimate character of a producer, and assume that of a *dealer*. This is especially the case with a farmer: inasmuch as the regular routine of his business points out a particular season as that at which he can most fitly thresh and dress his saleable corn, and bring it to market. This period is mid-winter, when the straw is needed for his cattle, and when the occupation of threshing and dressing corn, carried on as it is under shelter, and for the most part independently of the weather, enables him to dispose, without loss, of the labour he must needs pay for continuously, and cannot then use in the open fields. And, once ready for market, the grain must be sold, or the farmer must incur the outlay and the responsibilities of a dealer. To keep corn on hand, in large quantities, after it is threshed, requires store room and processes which have no proper place in the economy of the farm; and it is, in fact, very seldom done.

Now it obviously follows that, were the rule suggested by these observations strictly and generally acted upon, no corn would be brought to market by the growers much before Christmas, or after the end of February; and this would have one or two material advantages. It would render expedient, if not compel, the holding over by the dealers (on behalf of the consumers) of a much larger stock of corn from the produce of one harvest till after the gathering of the next, and thus tend to equalise prices between one harvest and another; and it would obviate the need for the practice, more or less common every year (and the reverse of economical), of bringing the soft new wheat at once into consumption by mixing it with old grain. It would also render much more facile the attempt, sure to be made before long, to take stock of the national corn-fund early enough every year to make all due and practicable provision for defects in the course of the current season. And the farmer who, in view of what has now been stated, can doubt that it would be for his benefit to have such an account placed before him once or twice a-year, at the cost only of contributing his own share of the materials, must surely be impervious to reasoning on this or any similar topic.

It is true that a good system of agricultural statistics, and all that could be immediately hoped for from it, would seem to offer but weak and scanty means toward so important an end as the one here in view. But experience does not warrant our reliance in such cases

upon a *coup de main*. The change required must be gradual. It must come of a conviction, among those most nearly concerned, that the change will promote their interest. Such convictions are of slow growth in any class, and can hardly be of rapid growth among farmers. They want good reasons, plainly stated, and plenty of time to consider them. It is for the benefit of us all that these conditions should be complied with. And when a movement of this kind shall once begin, in the right direction, it will be more rash to set a limit to what can be done than to predict a measure of success fully adequate to the efforts made for its attainment.

Science has already, by the single method of averages, conferred upon mercantile transactions all the benefits of insurance, distributing, and so apparently almost destroying, the pernicious effects of commercial uncertainty involved in life, fire, and sea-risks. But insurance is only one of the methods of forestalling commercial risk suggested by the action of intelligence upon trade. The commerce of towns has already largely benefitted by such methods. Agriculture is, of all the arts, the least so aided; hence (for the most part) the low condition of this art, the enormous fluctuations of its annual returns, and the very small provision of means for counteracting the natural causes of these fluctuations.

Here, then, we have offering itself for execution a task, than which none can be more worthy of the science of our own time.

And let it be remembered that it is not merely *a farmer's question*. It lies at the very root of the daily life of the nation. Pore as we may over the history of the country during the last fifty years, we still see, dimly but certainly apparent, behind all that is least welcome in the condition of the people, this fluctuation of the cost of the first necessary of life. Nor is the object in view that of raising, or artificially fixing, the price of corn. Far from it. It is that of eliminating, as far as possible, those elements of uncertainty which make it so difficult at present, not only for the farmer to guess, when sowing his seed, what will be the value of a bushel of the crop, but for "pater familias," everywhere, to guess the length of next year's baker's bill, or to foresee the price of consols, or the interest of money, or how his income may be affected by stagnant commerce, or his health by the pestilence that dogs the heels of famine. And it is only with a firm belief that science, rightly applied, may effect much improvement in this direction, that I have ventured so long to occupy the time of the section.

Carnsdale House, Barnston, Cheshire.

APPENDIX.

TABLE I.

Average Annual Prices, as published in the London Gazette, of Wheat, Barley, and Oats.

Year.	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
1843.....	50	1	29	6	18	4
1844.....	51	3	33	8	20	7
1845.....	50	10	31	8	22	6
1846.....	54	8	32	8	23	8
1847.....	69	9	44	2	28	8
1848.....	50	6	31	6	20	6
1849.....	44	3	27	9	17	6
1850.....	40	3	23	5	16	5
1851.....	38	6	24	9	18	7
1852.....	40	9	28	6	19	1
1853.....	53	3	33	2	21	0

TABLE II.

Average Annual Prices for the Harvest Years, (commencing the first week in September,) of Wheat, Barley, and Oats.

Year.	Wheat.		Barley.		Oats.	
	s.	d.	s.	d.	s.	d.
1843—44.....	53	0	32	6	19	8
1844—45.....	47	1	32	5	21	6
1845—46.....	54	7	30	2	23	1
1846—47.....	70	11	46	7	29	5
1847—48.....	51	2	31	5	21	4
1848—49.....	47	8	29	6	18	7
1849—50.....	40	4	24	7	16	4
1850—51.....	39	10	24	1	18	2
1851—52.....	39	10	27	7	17	8
1852—53.....	44	7	29	11	19	0
1853—54.....	74	0	38	0	26	11

TABLE III.
Monthly Quantities of Wheat Returned as Sold in the 290 Inspected Markets of England and Wales—1843-44 to 1853-54.

Harvest Year.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.
	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.	Qrs.
1843—44	461,509	531,389	441,236	549,480	412,434	448,457	510,013	305,750	400,919	481,213	338,206	386,732
1844—45	450,527	540,784	626,296	554,176	518,031	539,476	726,759	442,393	600,869	439,798	439,632	785,641
1845—46	414,693	618,168	665,163	475,617	503,317	435,939	422,775	444,373	531,126	356,951	383,642	438,233
1846—47	654,509	815,455	419,373	553,070	671,199	394,946	454,255	316,996	487,166	169,755	232,062	192,668
1847—48	288,362	533,539	422,637	474,062	517,585	396,264	372,211	410,633	354,982	417,153	547,280	529,976
1848—49	599,073	416,353	391,815	446,509	359,246	322,163	374,296	312,814	310,221	387,606	268,015	289,866
1849—50	418,820	497,869	409,369	503,698	414,332	382,673	419,935	317,497	354,972	459,974	313,442	407,610
1850—51	372,942	399,442	466,904	377,524	320,200	349,256	384,582	312,797	378,181	347,170	238,485	367,838
1851—52	364,951	447,582	513,836	462,163	504,217	375,173	362,528	288,203	452,578	402,656	330,593	341,367
1852—53	351,292	566,926	405,281	473,699	532,282	345,329	358,886	390,214	360,612	348,435	412,399	322,168
1853—54	384,558	470,625	287,437	347,966	260,477	256,061	227,626	239,601	244,733	219,775	233,732	228,478
Average	432,839	530,739	459,049	474,360	455,847	385,976	419,442	343,751	406,941	366,407	339,771	390,052

TABLE IV.
Monthly Average Prices of Wheat in England and Wales, arranged in Harvest Years.

Harvest Yr.	September	October	November	December	January	February	March.	April	May.	June.	July.	August.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1843—44	51 4	50 5	51 7	50 6	51 1	53 5	56 3	55 4	55 6	55 7	54 4	50 0
1844—45	46 4	46 1	45 11	45 3	45 8	45 4	45 3	46 1	45 11	47 10	49 7	55 9
1845—46	53 10	57 10	58 10	57 10	55 6	54 7	54 10	55 9	55 9	52 1	51 5	46 3
1846—47	50 10	58 7	60 7	60 3	69 11	72 10	75 4	75 4	88 9	92 10	79 2	66 3
1847—48	52 9	54 9	53 3	52 3	53 3	50 9	50 5	50 3	49 0	47 7	48 7	50 11
1848—49	54 2	51 9	51 9	48 2	45 1	46 1	44 11	44 9	45 4	44 7	48 3	46 6
1849—50	43 3	41 7	40 8	39 3	40 6	38 4	38 1	37 10	38 9	40 2	42 0	43 8
1850—51	42 9	41 0	40 1	39 3	38 1	37 8	37 3	39 0	38 8	40 7	42 11	40 11
1851—52	37 10	35 11	36 6	37 5	38 4	42 2	42 6	41 0	40 9	40 9	40 10	40 11
1852—53	41 9	38 6	39 11	43 3	46 0	45 2	45 4	44 6	44 2	44 9	49 9	51 7
1853—54	54 6	65 11	72 5	71 7	80 2	80 10	78 10	77 2	79 2	78 8	74 0	63 4
Average....	48 1	49 3	50 1	49 6	51 2	51 6	51 8	51 6	52 10	53 2	52 10	50 6

TABLE V.

Quarterly Fluctuations of the Quantity of Home Grown Wheat, returned as sold in the 290 Inspected Markets of England and Wales; with the concurrent Fluctuations of the Average Price; each in relation to the Average (for each quarter) of the Ten Harvest Years 1843-44 to 1852-53.

Harvest Year.	Quarters.	Quantity sold in Inspected Markets.	Average Price.	Quantity in excess of the Average of the corresponding Quarter in the ten Years 1843-44—1852-53.	Quantity in deficiency of the same Average.	Price in excess of same Average.	Price in deficiency of same Average.
		Qrs.	s. d.	Qrs.	Qrs.	s. d.	s. d.
1843—44	I.	1,434,134	51 1	...	16,524	3 5	...
	II.	1,411,371	51 8	50,020	...	3 7	...
	III.	1,216,682	55 8	732	...	6 4	...
	IV.	1,206,151	53 4	68,495	...	3 4	...
1844—45	I.	1,617,607	46 1	166,949	...	...	1 7
	II.	1,611,683	45 5	250,332	...	...	2 8
	III.	1,770,021	45 9	554,071	...	...	3 7
	IV.	1,665,071	51 0	527,415	...	0 8	...
1845—46	I.	1,698,024	56 10	247,366	...	9 2	...
	II.	1,414,873	55 11	53,522	...	7 10	...
	III.	1,398,274	55 5	182,324	...	6 1	...
	IV.	1,178,826	49 11	41,170	...	...	0 5
1846—47	I.	1,889,537	56 8	438,879	...	9 0	...
	II.	1,619,215	67 8	258,064	...	19 7	...
	III.	1,258,387	79 9	42,437	...	30 5	...
	IV.	594,485	79 5	...	543,171	29 1	...
1847—48	I.	1,244,831	53 7	...	215,827	5 11	...
	II.	1,387,911	52 1	26,560	...	4 0	...
	III.	1,137,826	49 10	...	78,124	0 6	...
	IV.	1,494,409	49 0	356,753	...	...	0 8
1848—49	I.	1,407,241	52 6	...	43,417	4 10	...
	II.	1,127,918	46 5	...	233,433	...	1 8
	III.	997,331	45 0	...	218,619	...	4 4
	IV.	945,487	46 5	...	192,169	...	3 11
1849—50	I.	1,326,058	41 10	...	124,600	...	5 10
	II.	1,300,763	39 4	...	60,648	...	8 9
	III.	1,092,404	38 2	...	123,556	...	11 2
	IV.	1,181,026	41 11	53,370	...	...	8 5
1850—51	I.	1,239,288	41 3	...	211,370	...	6 5
	II.	1,046,980	38 4	...	314,371	...	9 9
	III.	1,075,560	38 3	...	140,390	...	11 1
	IV.	953,493	41 5	...	184,163	...	8 11
1851—52	I.	1,326,369	36 9	...	124,289	...	10 11
	II.	1,341,553	39 3	...	19,798	...	8 10
	III.	1,103,309	41 5	...	112,641	...	7 11
	IV.	1,074,616	42 2	...	63,040	...	8 2
1852—53	I.	1,323,499	40 0	...	127,159	...	7 8
	II.	1,351,310	44 9	...	10,041	...	3 4
	III.	1,109,712	44 8	...	106,238	...	4 8
	IV.	1,083,002	48 8	...	54,654	...	1 8
1853—54	I.	1,142,620	64 3	...	308,038	16 7	...
	II.	864,504	77 6	...	496,857	29 5	...
	III.	711,960	78 4	...	503,990	29 0	...
	IV.	681,985	72 0	...	455,671	21 8	...

TABLE VI.

Annual Fluctuations of the Probable Quantity of Home-Grown Wheat sold in England and Wales during the Eleven Harvest Years from September, 1843, to September, 1854, with the concurrent fluctuations of the Returns to the Growers; both in relation to the Average of the ten Harvest Years from September, 1843, to September, 1853.

Harvest Year.	Quarters.	Quantity Sold in the 290 Inspected Markets.	Assumed Quantity Sold; that inspected being $\frac{4}{5}$ ths of the whole.	Average Price.	Total Cost.	Cost in Excess of the Average Cost of Ten Years, 1843-4—1852-3.	Cost in Deficiency of the same Average.			
1843—44	I.	Qrs.	Qrs.	s. d.	£	£	£			
		1,434,134	4,015,572	51 1	10,256,438	3,713,000	....		
		1,411,371	3,951,838	51 8	10,208,908					
		1,216,682	3,406,708	55 8	9,481,996					
		1,206,151	3,377,222	53 4	9,006,044					
	II.	14,751,340	51 6	38,953,386						
		1,617,607	4,529,398	46 1	10,436,258					
					8,670,000	....			
1844—45	III.	1,611,683	4,502,710	45 5	10,277,610	8,670,000	....		
		1,770,021	4,956,058	45 9	11,337,980					
		1,665,071	4,662,148	51 0	11,888,602					
		18,650,314	47 2	43,910,450						
		1,698,024	4,757,464	56 10	13,510,598					
	IV.					6,432,000	....		
1845—46	I.	1,414,873	3,961,642	55 11	11,076,088	6,432,000	....		
		1,398,274	3,915,164	55 5	10,848,264					
		1,178,826	3,300,712	49 11	6,238,028					
		15,934,982	52 3	41,672,978						
		1,889,537	5,290,702	56 8	14,990,320					
	II.					15,749,000	....		
1846—47	III.	1,258,387	3,523,482	79 9	14,049,884	15,749,000	....		
		594,485	1,664,558	79 5	6,609,678					
		15,012,544	67 10	50,989,244						
		1,244,831	3,485,526	53 7	9,337,656					
1847—48	IV.	1,387,911	3,886,150	52 1	10,120,180	2,407,000	....		
		1,137,826	3,185,912	49 10	7,938,166					
		1,494,409	4,184,342	49 0	10,251,636					
		14,741,930	51 2	37,647,638						
		1,407,241	3,940,274	52 6	10,251,638					
	I.					5,231,000	....		
1848—49	II.	997,331	2,792,526	45 0	6,283,182	5,231,000	....		
		945,487	2,647,362	46 5	6,144,684					
		12,538,322	48 0	30,009,066						
		1,326,058	3,712,960	41 10	7,766,274					
1849—50	III.	1,300,703	3,641,966	39 4	7,162,516	7,123,000	....		
		1,092,404	3,058,728	38 2	5,958,144					
		1,181,026	3,306,872	41 11	6,930,650					
		13,720,526	40 7	27,817,584						
		1,244,831	3,485,526	53 7	9,337,656					

TABLE VI.—Continued.

Harvest Year.	Quar-ters.	Quantity Sold in the 290 Inspected Markets.	Assumed Quantity Sold; that inspected being $\frac{1}{4}$ this of the whole.	Average Price.	Total Cost.	Cost in Excess of the Average Cost of Ten Years, 1843-4—1852-3.	Cost in Deficiency of the same Average.
1850—51	I.	Qrs., 1,239,288	Qrs. 3,470,004	s. d. 41 3	£ 7,156,882	£ ...	11,177,000
	II.	1,046,980	2,931,544	38 4	5,618,792		
	III.	1,075,560	3,011,568	38 3	5,759,622		
	IV.	953,493	2,669,778	41 5	5,528,664		
			12,082,894	40 0	24,063,960		
1851—52	I.	1,326,369	3,713,830	36 9	6,824,158	8,304,000
	II.	1,341,553	3,756,346	39 3	7,371,616		
	III.	1,103,309	3,089,262	41 5	6,397,312		
	IV.	1,074,616	3,008,924	42 2	6,343,814		
			13,568,362	39 10	26,936,930		
1852—53	I.	1,323,499	3,705,794	40 0	7,411,588	5,045,000
	II.	1,351,310	3,783,668	44 9	8,465,952		
	III.	1,109,712	3,107,192	44 8	6,939,394		
	IV.	1,083,002	3,032,404	48 8	7,378,848		
			13,629,058	44 5	30,195,782		
1853—54	I.	1,142,620	3,199,336	64 3	10,277,864	376,000
	II.	864,504	2,420,608	77 6	9,379,706		
	III.	711,960	1,993,488	78 4	7,807,828		
	IV.	681,985	1,909,568	72 0	7,399,576		
			9,523,000	73 3	34,864,974		

TABLE VII.

Total probable Supply of Wheat in the Markets of England and Wales during the Eleven Harvest Years from September, 1843, to September, 1854.

Harvest Year.	Estimated Quantity of Home-Grown Wheat Sold.	Foreign Wheat and Flour Entered for Home Consumption.	Total Probable Supply.	True Average Price obtained for British Wheat, as per Table VI.
1843—44...	Qrs. 14,751,340	Qrs. 1,701,224	Qrs. 16,452,504	£ 2·575
1844—45...	18,650,314	314,689	18,965,003	2·353
1845—46...	15,934,982	2,817,245	18,752,227	2·612
1846—47...	15,012,544	3,505,634	18,518,178	3·391
1847—48...	14,741,930	2,428,484	17,170,414	2·558
1848—49...	12,538,322	5,660,422	18,198,744	2·4
1849—50...	13,720,526	3,763,467	17,483,993	2·029
1850—51...	12,082,894	6,196,958	18,279,852	2·
1851—52...	13,568,362	3,711,058	17,279,420	1·991
1852—53...	13,629,058	5,930,460	19,559,518	2·221
1853—54...	9,523,000	6,022,451	15,545,451	3·662